

Beyond Transport

Delivering unique network operator value to end users

By C. Mills, P. Carden

Introduction

As connectivity becomes a commodity, the challenge for network operators is to emerge as an essential part of the new revenue chain by using network-based capabilities to provide unique value. Network operators must focus on differentiation, using a service and technology paradigm the industry (including the largest mobile telecoms body, the Global System for Mobile communications [GSM] Association) refers to as Telco 2.0.

Differentiation through Service Mashups for Blended Services

Telco 2.0 is based on the concept of the service mashup – the creation of new services by innovative combination of existing service elements and network capabilities.

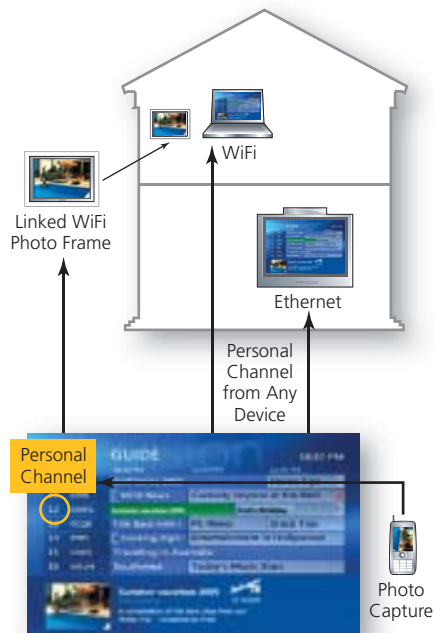
Consider, for example, a working-age consumer, Jo, who subscribes to a Triple-Play service consisting of IPTV, Internet access and fixed phone service. Jo also subscribes to a mobile phone service from a different service provider. She is an experienced user of digital media, especially digital photos, movies and music.

How can we enhance her service experience using the Telco 2.0 service mashup approach? In a Web 2.0 scenario, we might expect Jo to organize digital photos and publish them on a community web site for others to see. In a Telco 2.0 scenario we can go much further, making the photos available on a private channel on the IPTV service so that Jo can show visitors her photos on the living room TV rather than having to go to another room to boot up the PC. Other IPTV subscribers can view her photos by going to her private channel. Either the network operator or a third-party application developer can create this new service, assuming the operator provides access to the service components it controls.

Now we can mash in a new service element consisting of a WiFi-enabled electronic picture frame. Today's electronic picture frames, which are beginning to gain popularity, typically rotate through the pictures on a memory card or are uploaded via USB. But Jo's new WiFi-enabled picture frame connects to her private channel, and she has sent another one to her parents as a Christmas gift.

At this point Jo has invested significant time and effort to arrange her digital heritage, significantly decreasing the likelihood that she will change providers. She has perhaps also influenced her parents to choose the same provider to get their own Triple-Play offering. When looking for a new mobile phone, she discovers that if she takes the mobile phone from her existing Triple-Play service provider, she can save photos directly from her mobile phone to her private channel and display them on her mobile phone, courtesy of additional service mashups. These blended services are illustrated in Figure 1.

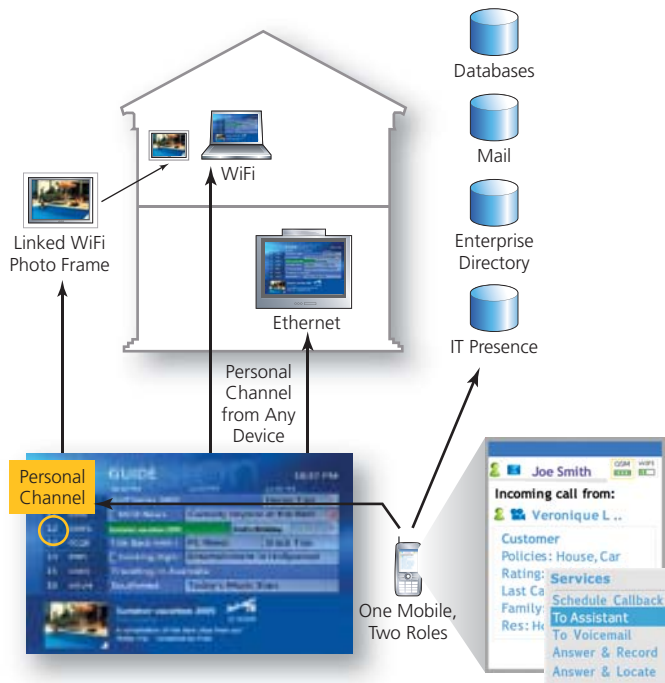
Figure 1: Illustrative service mashups related to digital photo collections



For business communications, there are several parts of the user experience where service mashups make a difference, even before a call starts.

- **Call Initiation.** Enterprise users want their own contact information to be available and consistent regardless of the location or device from which the communication comes. So contact lists should be network-based (as opposed to device-based) and lookups need to be able to access the corporate directory. Mashups are also needed to leverage network-based recent/missed call lists (accessible from any device), presence-enabled team lists and virtual meeting rooms.
- **Incoming Calls.** Putting a service mashup into call center applications, we can display extensive customer information on a salesperson's mobile phone. We can also provide call handling options, either on-demand or pre-arranged, based on parameters such as the calling party's identity, time-of-day and recipient's calendar.

Figure 2: The addition of a “business role” on the mobile phone

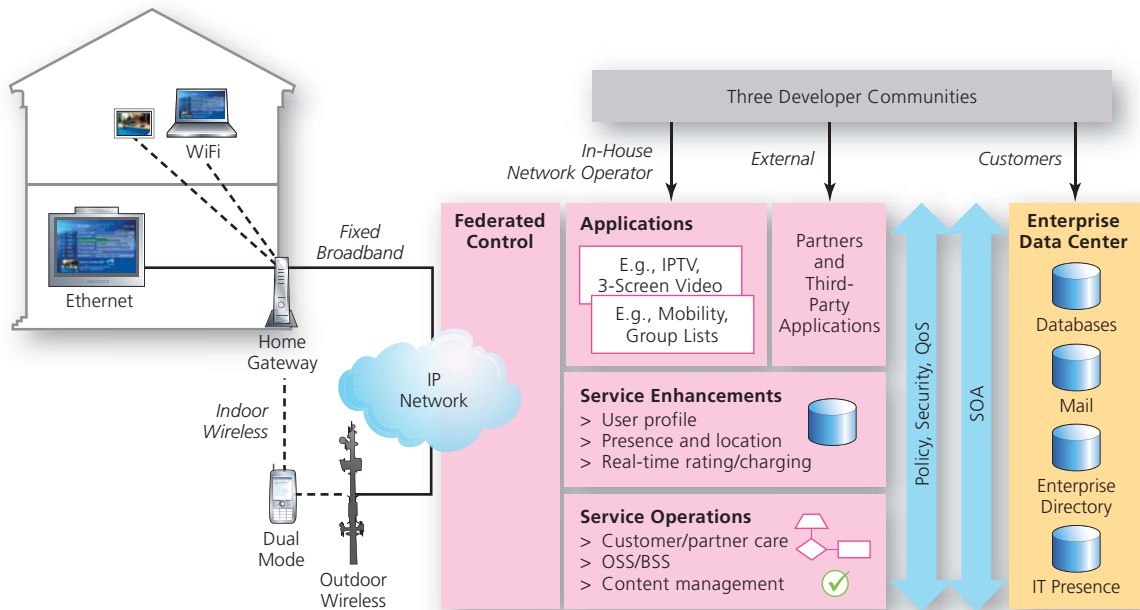


While the presentation is different depending on whether the business person is using a mobile phone, deskphone or soft-phone client on a PC, the functionality of the service mashup should be consistent. As Figure 2 highlights, business-related service mashups require integration with enterprise systems such as databases, mail, directories and IT presence solutions.

New Technology Capabilities in Telco 2.0

Figure 3 shows a combination of WiFi devices (e.g., laptop, picture frame) and Ethernet-connected devices (e.g., IPTV set-top box) inside the home connected via a home gateway over broadband to our IP backbone. In addition to the network, operators have service enablers and service operations/billing systems, as well as their own applications. Enterprise services and data access may also be involved.

Figure 3: Architectural components involved in Telco 2.0



As mobile networks move to an IP Multimedia Subsystem (IMS) for voice services, the flexibility of mashup services and cost effectiveness will further improve, but it is worth noting that none of the mashup scenarios described so far depend on a full IMS infrastructure being in place; in particular, the mobile phone can use the circuit-switched network for voice calls, while using its packet-data capabilities for service mashups. This adds significant service value even where the phone or network constraints don't support simultaneous transmission of data and circuit-switched voice (e.g., this is true for most GSM handsets). Many of the highest value service mashups occur before or after a call – for example, directory or contact list lookup, incoming call context and photo capture.

The main characteristics of Telco 2.0 and the technology capabilities required to implement it across existing fixed and mobile technology sets include:

- **Developer Communities.** Service mashups may be created in-house by the service provider, by third-party external service developers or by customers themselves.
- **Service Oriented Architecture.** To expose the service elements that can be combined by these different developer communities, it is necessary to provide a consistent, widely understood mechanism to locate and execute the different service elements. This is achieved using web-services interfaces in a Service-oriented Architecture (SOA), containing elements such as a service registry and activity logger.
- **Client and Server Applications.** Mashups combine the different service elements, exposed via SOA, to create new value. This can occur either on the client or server, or both.
- **Java Service Creation Environment.** The selection of Service Creation Environment is important since it should be, where possible, consistent across client and server-side applications as well as between the different development communities to facilitate re-use of code. The development technology most consistent across the Web 2.0 and enterprise development communities is Java.

Now let us look at some examples of differentiating Telco 2.0 capabilities that enable the creation of services with unique value to customers. The resulting service mashups may or may not be developed in-house by the network operator, but they do rely on Telco 2.0 capabilities exposed by the operator to realize the value created.

- **Virtual Real Estate.** While the browser connects the PC to an Internet world that is very open, television and mobile services remain less open. The network operator controls this virtual real estate and can expose it to internal and external development communities. For example, the operator may provide a web service that pops up a window on the IPTV screen or gives control of an advertising pane in the electronic program guide. Variations on these web services might equally allow pop-ups on the mobile phone screen or give control of the mobile idle screen for advertisements.
- **Profiling and Preferences.** Advertisements can be delivered by the operator themselves – as a way of improving affordability for younger customers – or by external parties that pay to do so. In either case, the value of each ad is increased if the service provider offers enhanced information about the customer, based on profile and preferences, to achieve targeted advertising. The operator has access to an extensive amount of data about each subscriber's preferences and habits, based on IPTV activity, web purchases, calling patterns and contacts, community memberships and self-care preference databases.
- **Presence and Location.** Another way to add value to advertising is by leveraging location information. While some profile and presence information may be obtained without involvement of the network operator, others are unique – for example, the current IPTV program viewed, or mobile phone state (on/off, roaming, busy) and location.
- **Mobile Inclusion.** Operators can deliver significant value by improving a user's level of control over incoming calls, especially for enterprise users who have several communications devices and work closely with other staff members. The operator can deliver significant network-based differentiation by extending traditional Private Branch eXchange (PBX) features – like Manager-Secretary, Ringback-When-Free and Dual-Ringing – to include mobile phones via network-based service logic.
- **Smart-Call Routing.** We can further enhance control over incoming calls through “Personal Assistant” and “One Number” services allowing users to create rules for handling incoming calls – which calls go to fixed, mobile, voicemail or a secretary, at what times of day – and rapidly change these settings from the mobile or deskphone. Such capabilities become even more powerful if combined with presence information, since the rules can now take into consideration the user's state. For example, this would enable a rule such as “If I am talking on my mobile, calls to my mobile phone number go to my voicemail, except my VIP-list, which goes to my secretary.” This presence-enabled “Smart-Call Routing” capability can itself be a separate Telco 2.0 service capability exposed to other applications.
- **Billing, Subscription and Prepay.** If third-party developers wish to deliver a new service to customers of the network operator, one choice is to sell and charge for the service separately from the network operator. This may be fine for network operators if they are in turn charging the developer for use of the Telco 2.0 services capabilities. However, in most cases it is probably more convenient for both users and developers if the operator takes care of offering the service on its portal and handles the billing.

- **Network Characteristics, Events and Quality of Service.** For optimal user experience, an application should be able to use a web service that describes the current network connection of a device and be notified when the characteristics of that connection change. A desirable extension is for an application to be able to request a higher-priced quality-of-service (QoS) for a particular session.
- **Enterprise Premises Integration.** The integration of enterprise premises services and databases can work two ways: by enabling network-based services to securely interact with enterprise systems and by enabling enterprise application developers (in-house either to the enterprise or its solution suppliers) to access operator-based Telco 2.0 capabilities. An example of the first scenario would be a network-hosted enterprise mobility service that allows lookups in the enterprise directory and interworks with PBX-attached deskphones. An example of the latter is a corporate intranet whose directory lookup returns the mobile presence and location of employees.

It is important to put in place the Telco 2.0 foundations of SOA and a Multi-Tiered Service Creation Environment that includes Java Service Creation capabilities. These will expose services in an efficient manner and support rapid service development in an environment that provides the optimal combination of speed, flexibility and performance. Once this is established, the next step is to build capabilities that provide the strongest differentiation of service mashups.

Although this can be done solely with a combination of web services and legacy telecommunications environments, there are distinct advantages to building the Telco 2.0 environment on IMS. IMS provides a common session control architecture that includes support for global roaming between different mobile service providers. In addition, IMS provides significant operational expenditure reductions for a high volume of applications, which is a Telco 2.0 goal; and over the long-term it can reduce capital expenditures by eliminating redundant systems found in a silo technology approach.

Enabling New Business Models

Telco 2.0 speeds up the rate of innovation while providing control over which internal and external parties have access to specific differentiated network capabilities. Telco 2.0 may be used to support a range of business models – from a “total telecommunications provider,” cross-leveraging Internet, television and mobile assets, to a focus on pure Telco 2.0 network and enablers that only use external application development communities.

The development community can range from “no restrictions,” including small “garage shop” developers as well as large independent software vendors and mobile virtual network operators, to a focus on a small number of key partners. Another business model dimension to be considered is whether or not to offer Managed Services, which can offer economy-of-scale advantages and flexibility in contract options.

Conclusion

While there is no single path to success that meets the needs of all operators, Alcatel-Lucent has found the following elements to be essential:

- Clarify business goals and priorities. Until key stakeholders are aligned, the transformation project risks having people operate under different assumptions and drivers.
- Establish the end-vision and then a phased approach to getting there. It is fine if the end-vision changes over time, as long as each step produces measurable business success and moves the operator to the current end-vision.
- Consider the people, process, metrics and systems aspects of each phase.

- Add capabilities in a way that allows them to be blended with other services.
- Establish common, shared enablers (including data) as early as possible to gain flexibility, consistency and cost efficiencies.
- Establish a governance program and executive sponsorship. Moving from a silo approach to a converged, SOA approach requires an established governance framework – including best practices, tools, naming/segmentation conventions and review teams – plus consistent executive support.

The next few years promise to be exciting. Users will be able to have a single contact number, contact list and voice mailbox and access from anywhere to advanced applications. We'll see a rise in the Mobile Enterprise, where users are optimally productive no matter where they are. We can combine these capabilities with an easy-to-use interface that simplifies security with single-sign-on across multiple services, provides an intuitive and consistent interface across devices (e.g., phone, PC and television) and offers preference-driven services. Make it easy to access, easy to use and worth the price, and they will come. >>

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